

Delete paragraph 1 on page 64, lines 1-8 and replace with:

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Next, the mapping index for one of the equidistant servers is calculated using a predefined equation, STEP 2408. In particular, for  $k=0$  to the number of equidistant servers-1, the mapping index is equal to the 
$$[(\text{node\_number}) \bmod (\text{number\_of\_equidistant\_servers}) + k] \bmod (\text{number\_of\_equidistant\_servers})$$
, where mod refers to the module operation defined as the integer remainder of a division operation.

In the Claims:

Please amend claim 3, and cancel claims 4 and 5, without prejudice.

Please add new claims 6-14. All claims are reproduced herein for the Examiner's convenience.

1. (UNCHANGED) A system of managing clusters of a computing environment, said system comprising:

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a registry component to provide global data storage for data of a cluster of said computing environment, said cluster including one or more nodes of said computing environment;

a configuration component to maintain data locally on at least one node of said one or more nodes, and to store global data in said registry component;

a liveness component to provide status of one or more communications paths of said cluster, said liveness component being dependent upon said registry component and said configuration component;

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a group services component to provide one or more services to one or more other components of said cluster, said group services component being dependent on said registry component, said configuration component and said liveness component; and

a resource management component to provide communications to one or more resource controllers of said cluster, said resource management component being dependent on said registry component, said configuration component and said group services component.

2. (UNCHANGED) The system of claim 1, wherein said registry component is dependent on said group services component for at least one type of operation.

3. (AMENDED) The system of claim 2, wherein said at least one type of operation comprises a write operation.

4. (CANCELED)

5. (CANCELED)

6. (NEW) The system of claim 2, wherein said registry component is functionally dependent on said group services component.

7. (NEW) The system of claim 1, wherein said being dependent comprises being functionally dependent.

8. (NEW) The system of claim 7, wherein said registry component lacks a data dependency on said configuration component, said liveness component, said group services component and said resource management component.

9. (NEW) The system of claim 7, wherein said configuration component has a data dependency on said registry component.

10. (NEW) The system of claim 7, wherein said liveness component has a data dependency on said registry component.

11. (NEW) The system of claim 7, wherein said group services component has a data dependency on said registry component.

12. (NEW) The system of claim 7, wherein said resource management component has a data dependency on said registry component.

13. (NEW) The system of claim 7, wherein said liveness component has a data dependency on said configuration component.

14. (NEW) The system of claim 7, wherein said group services component has a data dependency on said configuration component.

15. (NEW) The system of claim 7, wherein said resource management component has a data dependency on said configuration component.

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16. (NEW) The system of claim 1, wherein said cluster includes a plurality of nodes, and wherein said registry component is included on less than all nodes of said plurality of nodes.

17. (NEW) The system of claim 1, wherein said configuration component is started by at least one operating system of at least one node of said one or more nodes of said computing environment.

18. (NEW) The system of claim 1, wherein said configuration component is responsible for starting one or more components of said registry component, said liveness component, said group services component and said resource management component.

19. (NEW) The system of claim 18, wherein the starting of one or more components satisfies at least one of

one or more functional dependencies between the one or more components and one or more data dependencies between the one or more components.

20. (NEW) The system of claim 18, wherein said one or more components are started by the configuration component in a defined order.

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21. (NEW) The system of claim 20, wherein said defined order comprises starting the registry component, and then the liveness component, the group services component and the resource management component.

22. (NEW) The system of claim 21, wherein said registry component begins a first phase of its initialization, in response to being started, said first phase of initialization comprising determining at least one copy of a global configuration database to be used in the starting.

23. (NEW) The system of claim 22, wherein said configuration component utilizes a copy of said at least one copy of the global configuration database to verify data, and then continue with starting the liveness component, the group services component and the resource management component.

24. (NEW) The system of claim 23, wherein said group services component completes its initialization, in response to the liveness component becoming available.

25. (NEW) The system of claim 24, wherein said registry component begins a second phase of its initialization, in response to the group services component completing initialization, said second phase of initialization comprising updating zero or more copies of the global configuration database to allow write operations against the global configuration database.

26. (NEW) The system of claim 25, wherein said resource management component performs its initialization using said system registry component and said group services component.

27. (NEW) A method of managing clusters of a computing environment, said method comprising:

providing, via a registry component, global data storage for data of a cluster of said computing environment, said cluster including one or more nodes of said computing environment;

maintaining, via a configuration component, data locally on at least one node of said one or more nodes, and to store global data in said registry component;

providing, via a liveness component, status of one or more communications paths of said cluster, said liveness component being dependent upon said registry component and said configuration component;

providing, via a group services component, one or more services to one or more other components of said cluster, said group services component being dependent on said registry component, said configuration component and said liveness component; and

providing, via a resource management component, communications to one or more resource controllers of said cluster, said resource management component being dependent on said registry component, said configuration component and said group services component.

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28. (NEW) The method of claim 27, wherein said registry component is dependent on said group services component for at least one type of operation.

29. (NEW) The method of claim 28, wherein said at least one type of operation comprises a write operation.

30. (NEW) The method of claim 28, wherein said registry component is functionally dependent on said group services component.

31. (NEW) The method of claim 27, wherein said being dependent comprises being functionally dependent.

32. (NEW) The method of claim 31, wherein said registry component lacks a data dependency on said

configuration component, said liveness component, said group services component and said resource management component.

33. (NEW) The method of claim 31, wherein said configuration component has a data dependency on said registry component.

34. (NEW) The method of claim 31, wherein said liveness component has a data dependency on said registry component.

35. (NEW) The method of claim 31, wherein said group services component has a data dependency on said registry component.

36. (NEW) The method of claim 31, wherein said resource management component has a data dependency on said registry component.

37. (NEW) The method of claim 31, wherein said liveness component has a data dependency on said configuration component.

38. (NEW) The method of claim 31, wherein said group services component has a data dependency on said configuration component.

39. (NEW) The method of claim 31, wherein said resource management component has a data dependency on said configuration component.



40. (NEW) The method of claim 27, wherein said cluster includes a plurality of nodes, and wherein said registry component is included on less than all nodes of said plurality of nodes.

41. (NEW) The method of claim 27, wherein said configuration component is started by at least one operating system of at least one node of said one or more nodes of said computing environment.

42. (NEW) The method of claim 27, further comprising starting, via said configuration component, one or more components of said registry component, said liveness component, said group services component and said resource management component.

43. (NEW) The method of claim 42, wherein the starting of one or more components satisfies at least one of one or more functional dependencies between the one or more components and one or more data dependencies between the one or more components.

44. (NEW) The method of claim 42, wherein said one or more components are started by the configuration component in a defined order.

45. (NEW) The method of claim 44, wherein said defined order comprises starting the registry component, and then the liveness component, the group services component and the resource management component.

46. (NEW) The method of claim 45, further comprising beginning, by said registry component, a first phase of its initialization, in response to being started, said first phase of initialization comprising determining at least one copy of a global configuration database to be used in the starting.

47. (NEW) The method of claim 46, further comprising utilizing, by said configuration component, a copy of said at least one copy of the global configuration database to verify data, and then continue with starting the liveness component, the group services component and the resource management component.

48. (NEW) The method of claim 47, further comprising completing, by said group services component, its initialization, in response to the liveness component becoming available.

49. (NEW) The method of claim 48, further comprising beginning, by said registry component, a second phase of its initialization, in response to the group services component completing initialization, said second phase of initialization comprising updating zero or more copies of the global configuration database to allow write operations against the global configuration database.

50. (NEW) The method of claim 49, further comprising performing, by said resource management component, its

initialization using said system registry component and said group services component.

51. (NEW) At least one program storage device readable by a machine tangibly embodying at least one program of instructions executable by the machine to perform a method of managing clusters of a computing environment, said method comprising:

providing, via a registry component, global data storage for data of a cluster of said computing environment, said cluster including one or more nodes of said computing environment;

maintaining, via a configuration component, data locally on at least one node of said one or more nodes, and to store global data in said registry component;

providing, via a liveness component, status of one or more communications paths of said cluster, said liveness component being dependent upon said registry component and said configuration component;

providing, via a group services component, one or more services to one or more other components of said cluster, said group services component being dependent on said registry component, said configuration component and said liveness component; and

providing, via a resource management component, communications to one or more resource controllers of said cluster, said resource management component being dependent on said registry component, said configuration component and said group services component.

52. (NEW) The at least one program storage device of claim 51, wherein said registry component is dependent on said group services component for at least one type of operation.

53. (NEW) The at least one program storage device of claim 52, wherein said at least one type of operation comprises a write operation.

54. (NEW) The at least one program storage device of claim 52, wherein said registry component is functionally dependent on said group services component.

55. (NEW) The at least one program storage device of claim 51, wherein said being dependent comprises being functionally dependent.

56. (NEW) The at least one program storage device of claim 55, wherein said registry component lacks a data dependency on said configuration component, said liveness component, said group services component and said resource management component.

57. (NEW) The at least one program storage device of claim 55, wherein said configuration component has a data dependency on said registry component.

58. (NEW) The at least one program storage device of claim 55, wherein said liveness component has a data dependency on said registry component.

59. (NEW) The at least one program storage device of claim 55, wherein said group services component has a data dependency on said registry component.

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60. (NEW) The at least one program storage device of claim 55, wherein said resource management component has a data dependency on said registry component.

61. (NEW) The at least one program storage device of claim 55, wherein said liveness component has a data dependency on said configuration component.

62. (NEW) The at least one program storage device of claim 55, wherein said group services component has a data dependency on said configuration component.

63. (NEW) The at least one program storage device of claim 55, wherein said resource management component has a data dependency on said configuration component.

64. (NEW) The at least one program storage device of claim 51, wherein said cluster includes a plurality of

nodes, and wherein said registry component is included on less than all nodes of said plurality of nodes.

65. (NEW) The at least one program storage device of claim 51, wherein said configuration component is started by at least one operating system of at least one node of said one or more nodes of said computing environment.

66. (NEW) The at least one program storage device of claim 51, wherein said method further comprises starting, via said configuration component, one or more components of said registry component, said liveness component, said group services component and said resource management component.

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67. (NEW) The at least one program storage device of claim 66, wherein the starting of one or more components satisfies at least one of one or more functional dependencies between the one or more components and one or more data dependencies between the one or more components.

68. (NEW) The at least one program storage device of claim 66, wherein said one or more components are started by the configuration component in a defined order.

69. (NEW) The at least one program storage device of claim 68, wherein said defined order comprises starting the registry component, and then the liveness component, the group services component and the resource management component.

70. (NEW) The at least one program storage device of claim 69, wherein said method further comprises beginning, by said registry component, a first phase of its initialization, in response to being started, said first phase of initialization comprising determining at least one copy of a global configuration database to be used in the starting.

71. (NEW) The at least one program storage device of claim 70, wherein said method further comprises utilizing, by said configuration component, a copy of said at least one copy of the global configuration database to verify data, and then continue with starting the liveness component, the group services component and the resource management component.

72. (NEW) The at least one program storage device of claim 71, wherein said method further comprises completing, by said group services component, its initialization, in response to the liveness component becoming available.

73. (NEW) The at least one program storage device of claim 72, wherein said method further comprises beginning, by said registry component, a second phase of its initialization, in response to the group services component completing initialization, said second phase of initialization comprising updating zero or more copies of the global configuration database to allow write operations against the global configuration database.

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74. (NEW) The at least one program storage device of claim 73, wherein said method further comprises performing, by said resource management component, its initialization using said system registry component and said group services component.

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